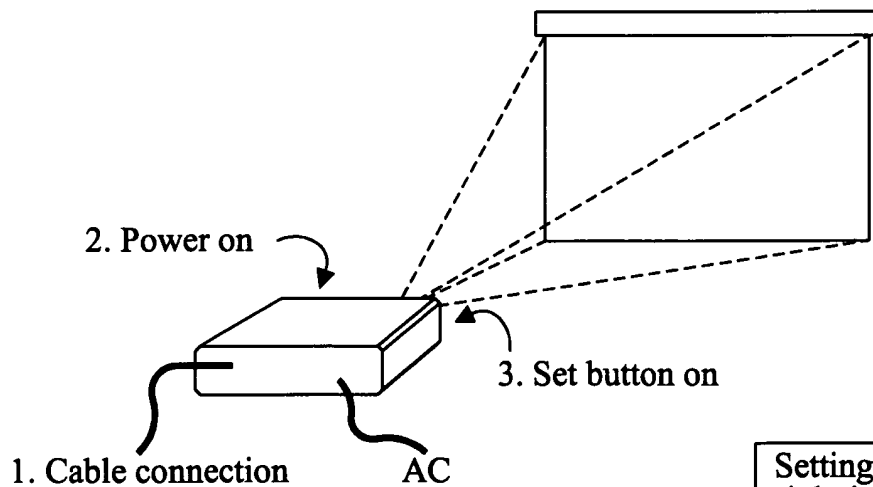


6-step procedure is required to project
an image in the right way.
(Steps 3-6 are repeated to make right
adjustment by confirming the results
of adjustment each time)

FIG. 1 (PRIOR ART)



Setting free model enables
right image projection by
just pressing the power
switch and set button.

FIG. 2

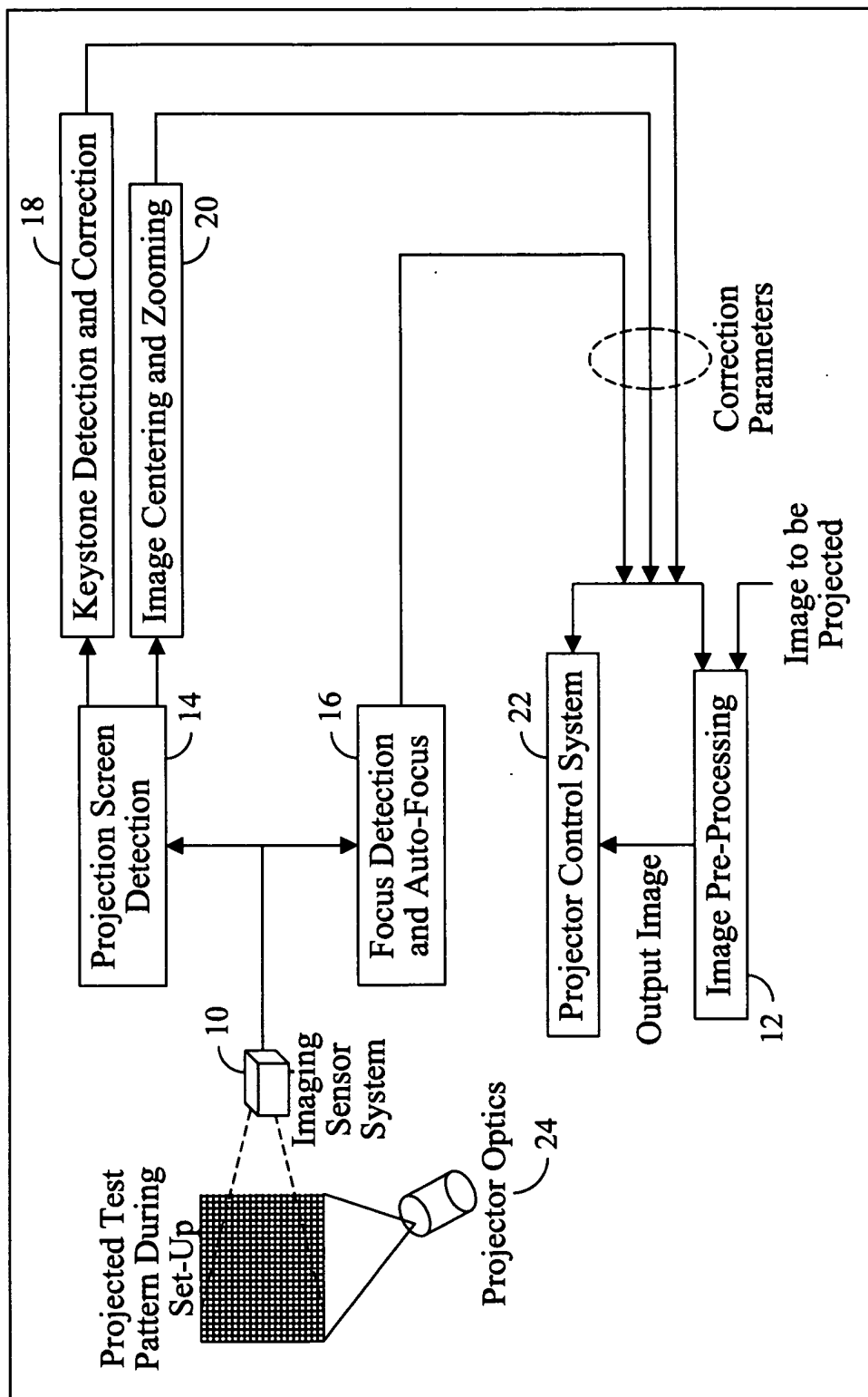


FIG. 3

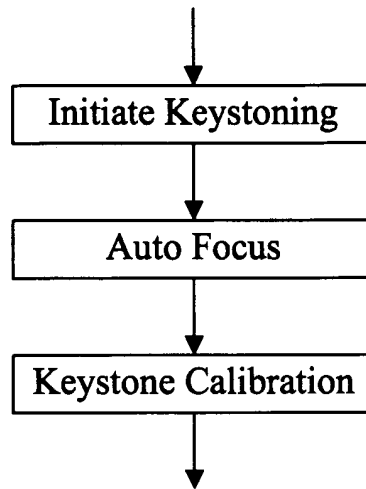
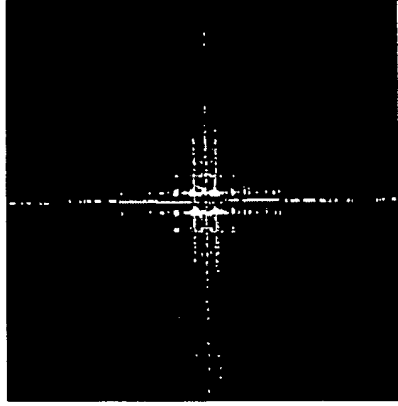


FIG. 4

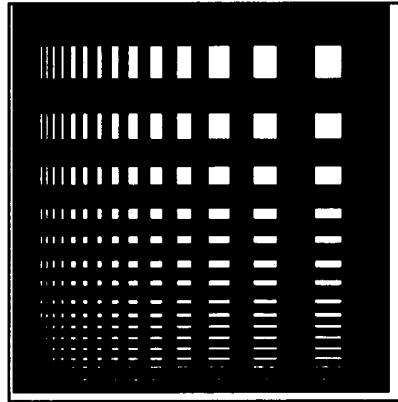
FIG. 8



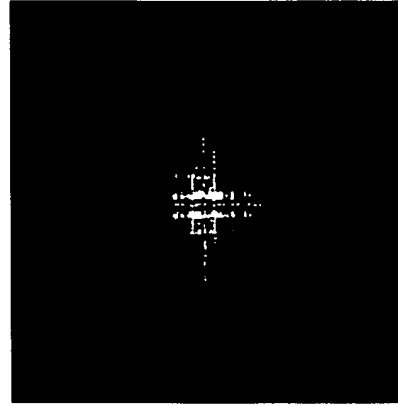
Spectrum



FIG. 5



Focused
Image



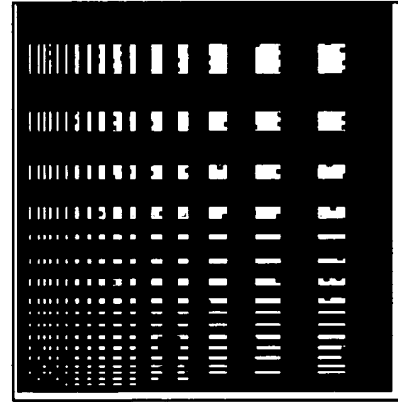
Spectrum



FIG. 7



FIG. 6



Out-of-focus
Image

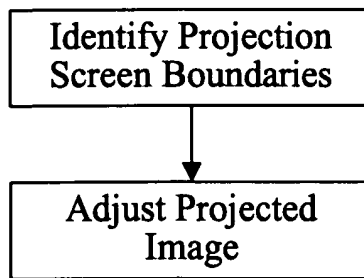


FIG. 9

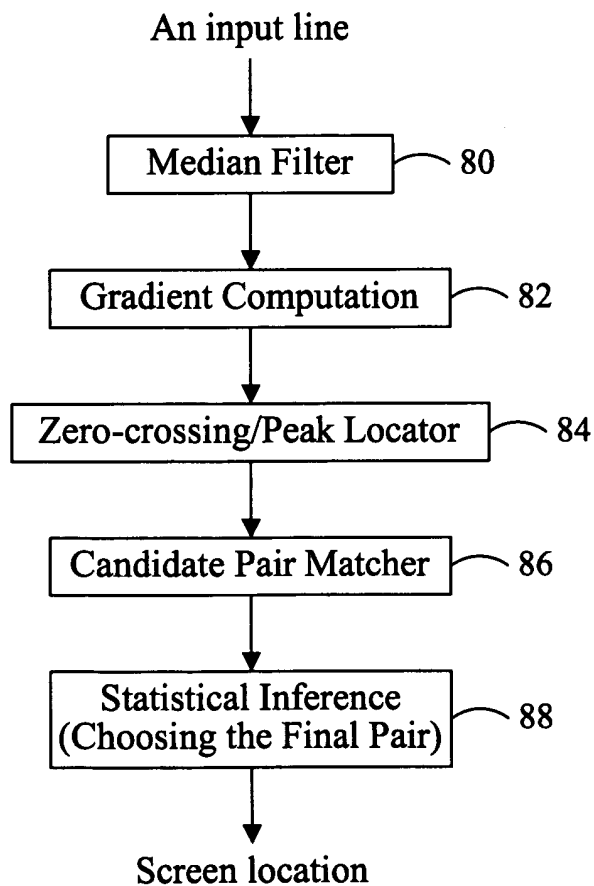
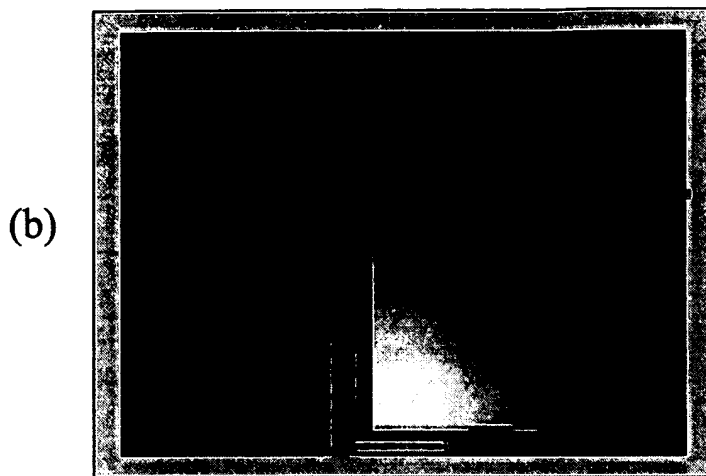
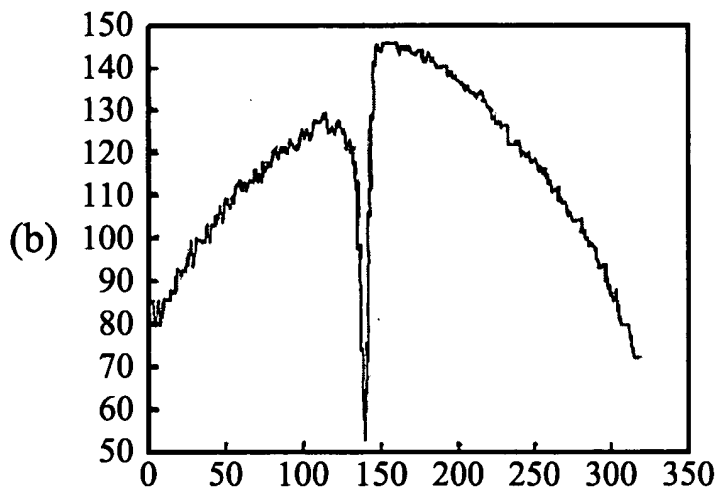


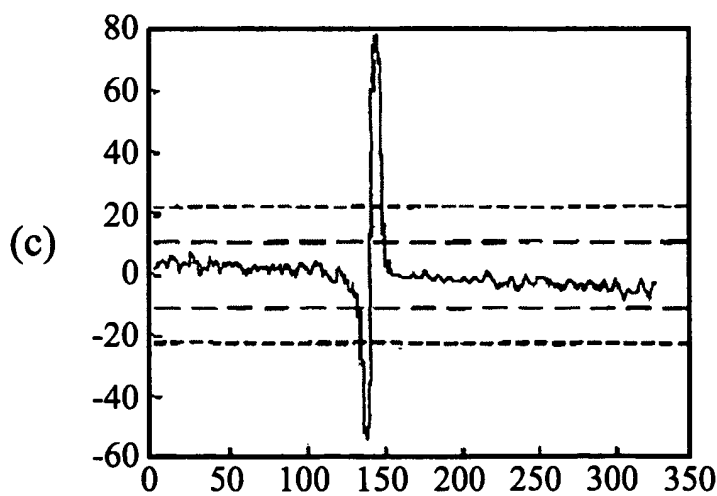
FIG. 10



An image of the screen from the projector's perspective. The line is assumed to be the one row that the 1-D sensor can sense.



The luminance values of the row in (a), illustrating that working in the luminance domain there may be no region that is uniform (and thus is potential screen area).



The gradient of (b).

FIG. 11

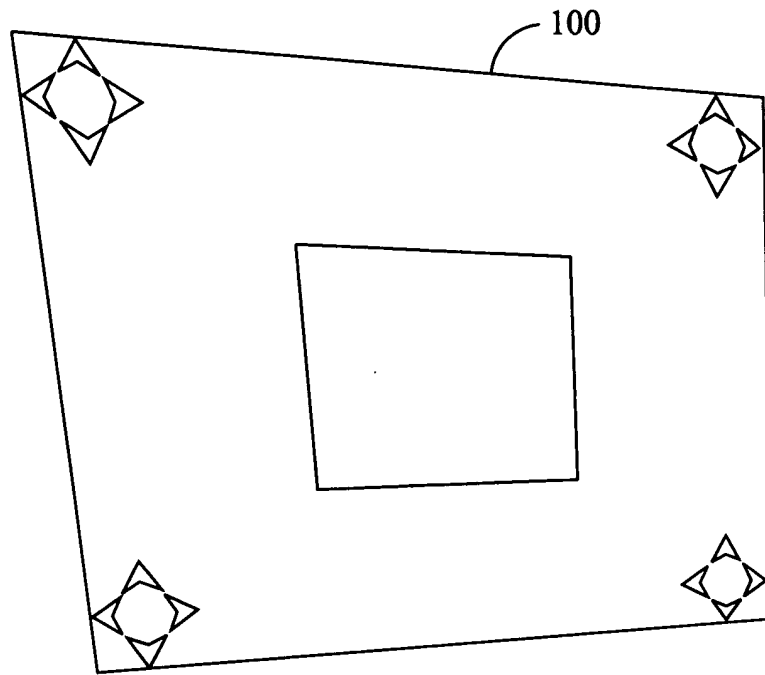


FIG. 12

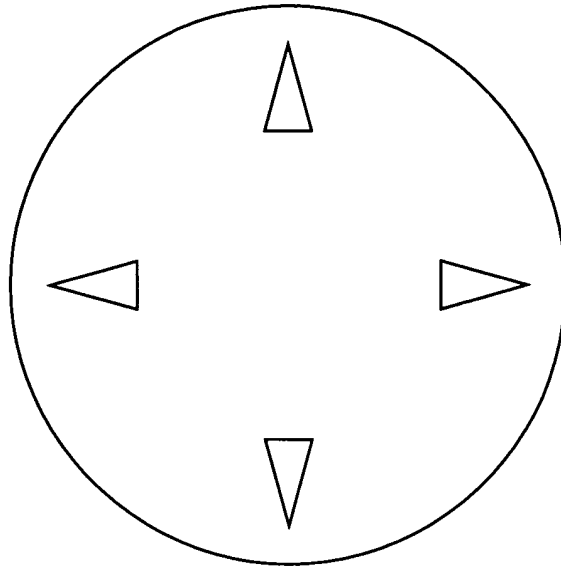
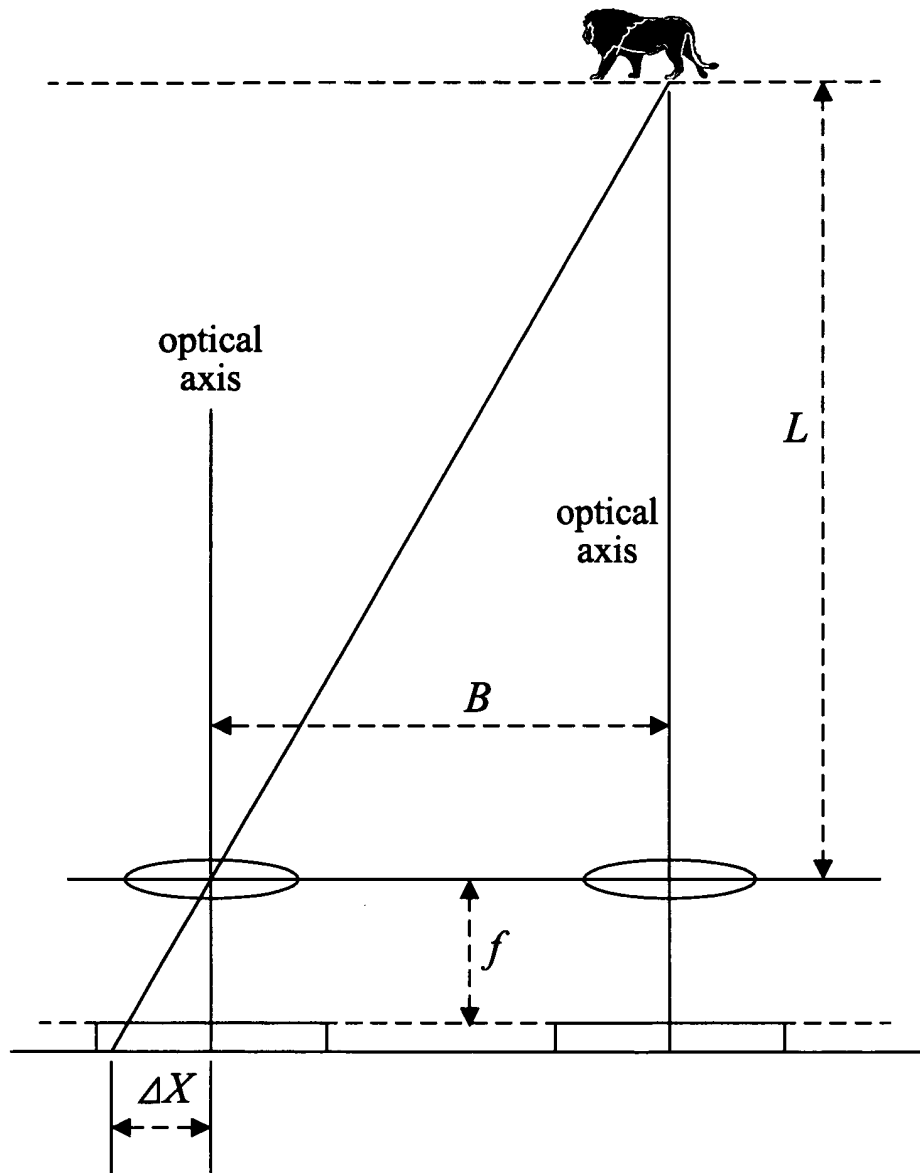


FIG. 13



Based on the similarity of the triangles, the distance L is computed as a function of the sensor parameters (B and f) and the disparity ΔX (difference between the two images of the same physical point):

$$L = \frac{Bf}{\Delta X}$$

FIG. 14

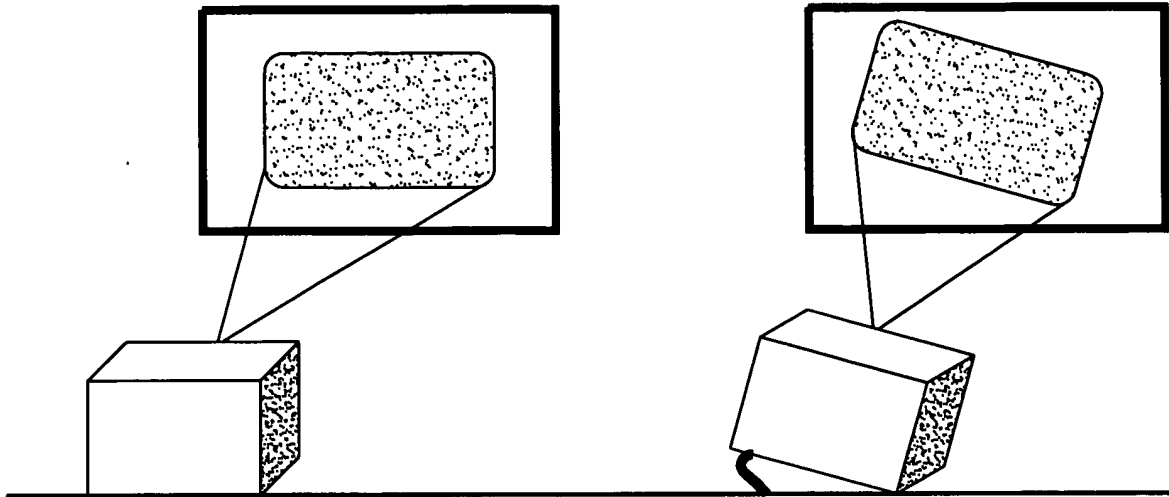


FIG. 16

FIG. 15